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05 APR 2002

DOE-0417-02

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V, SRF-5J
77 West Jackson Boulevard
Chicago, IL 60604—3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, OH 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF RESPONSES TO THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE DRAFT DATA PACKAGE FOR BASELINE GROUNDWATER CONDITIONS AT THE ON-SITE DISPOSAL FACILITY CELLS 1, 2, AND 3

References: 1) Letter, J. Saric to J. Reising, "OSDF Baseline Groundwater Conditions," dated February 13, 2002

2) Letter, T. Schneider to J. Reising, "Formal Submission of Comments on OSDF Baseline Data," dated March 21, 2002

The subject responses enclosed are to comments provided in References 1 and 2 above. As discussed during the March 12th teleconference with the Department of Energy, United States Environmental Protection Agency, Ohio Environmental Protection Agency, and Fluor Fernald, Inc., once resolution of the comments is achieved, the draft data package will be revised and submitted as the Technical Memorandum for Baseline Groundwater Conditions at Cells 1, 2, and 3. Once the Technical Memorandum is approved, the Groundwater/Leak Detection and Leachate Monitoring Plan will be revised to accommodate the agreed to revisions to the leak detection sampling program for Cells 1, 2, and 3.

If you should have any questions regarding this transmittal, please contact Robert Janke at (513) 648-3124.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:R.J. Janke

Enclosures: As Stated

cc w/enclosures:
R. J. Janke, OH/FEMP
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T. Schneider, OEPA-Dayton (three copies of enclosures)
G. Jablonowski, USEPA-V, SRF-5J
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F. Hodge, Tetra Tech
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cc w/o enclosures:
R. Greenberg, EM-31/CLOV
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RESPONSES TO U.S. EPA AND OHIO EPA TECHNICAL REVIEW COMMENTS ON DRAFT DATA PACKAGE FOR BASELINE GROUNDWATER CONDITIONS AT THE ONSITE DISPOSAL FACILITY CELLS 1, 2, AND 3

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

APRIL 2002

U.S. DEPARTMENT OF ENERGY

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RESPONSES TO U.S. EPA TECHNICAL REVIEW COMMENTS ON DRAFT DATA PACKAGE FOR BASELINE GROUNDWATER CONDITIONS AT THE ON-SITE DISPOSAL FACILITY CELLS 1, 2, AND 3

GENERAL COMMENTS

1. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 4.0 Pg.#: NA Line#: NA Code: C
Original General Comment #: 1
Comment: The leak detection evaluation assessments presented in Section 4.0 provide various explanations for the variations and trends noted in the data collected (analytical results, groundwater elevations, purge volumes, and so on). At this time, the assessments appear to be plausible explanations for the variations and trends observed. However, these assessments may require re-evaluation as more data become available during the monitoring period.
Response: The U.S. Department of Energy (DOE) agrees that the assessments in Section 4.0 may require re-evaluation, as more data become available.
Action: DOE will provide updates of the Section 4.0 assessments annually in the site environmental reports, Appendix A, Attachment A.6. These assessments will begin with the annual site environmental report for 2002.

2. Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: NA Line#: NA Code: C
Original General Comment #: 2
Comment: The text includes many acronyms (such as "BSL" in Figure 4-36) and abbreviations (such as "Marg. Detected" in Table 3-2). All these short forms should be defined in easy-to-locate places, such as in the acronym list on Page iv or in notes to every table or figure where they appear.
Response: DOE acknowledges the comment.
Action: The technical memorandum that will be issued based on the Data Package for Baseline Groundwater Conditions at the On-site Disposal Facility Cells 1, 2, and 3 will include an extensive acronym list and abbreviations will also be defined.

3. Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: NA Line#: NA Code: C
Original General Comment #: 3
Comment: The text notes that many parameters, such as mercury and technetium 99, were not detected at all or were detected in only a few samples. These parameters were then dropped from further consideration. However, as long as the analytical detection limits remain reasonably stable, any positive results for these parameters at compliance (downgradient) locations, including the leachate detection system, would indicate a possible release. Procedures for evaluating future positive results for these parameters should be developed and submitted to the regulatory agencies for approval.
Response: DOE agrees with the comment. As discussed during the 3/12/02 conference call, all 16 leak detection indicator constituents will be analyzed in the annual samples collected from Cells 1, 2, and 3 leachate collection system (LCS) and leak detection systems (LDS). If a constituent is detected in either the LCS or LDS, then confirmatory sampling consisting of three quarterly samples will be collected from the horizon in which it was detected.

Depending on the magnitude and/or persistence of the constituent detected in the LCS or LDS, DOE will consider sampling for the detected constituent in the next (lower) horizon (e.g., if detected in the LCS, then sample for detect in the LDS, or if detected in the LDS, then sample for detect in the horizontal till well). If the constituent is detected in the next lower horizon, DOE will again conduct confirmatory sampling consisting of three quarterly samples. This strategy will continue, as necessary, based on detected constituents to ensure that a thorough evaluation of all detected constituents is completed.

Action: The technical memorandum will include the evaluation protocol identified within the response. DOE will modify the OSDF Groundwater/Leak Detection and Leachate Monitoring Plan (GWLMP) to incorporate the sampling strategy outlined in the response.

SPECIFIC COMMENTS

4. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 3.1.2 Pg.#: 3-3 Line#: NA Code: C
Specific Comment #: 1

Comment: The text lists reasons that only the post-purging data were used. The text should also note that there are generally more post-purging data points than unpurged data points, which gives more statistical power to the post-purging data.

Response: DOE agrees with the comment and the requested text will be added to the technical memorandum. It should be noted that the frequency of the data sets was standardized (i.e., bi-monthly) prior to statistical tests. The tests were performed to determine whether data (purging and not purging) were similar enough to combine and use all data (not just the purged).

Action: The technical memorandum will include a statement that there were generally more post-purging sample results than unpurged sampling results.

5. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 3.1.4 Pg.#: 3-4 Line#: NA Code: C
Specific Comment #: 2

Comment: The text states that some trends are "up, marginal" as opposed to "up, significant" but does not define the terms. These terms should be defined in the text. In addition, Section 3.1.4 concludes that the observed trends result from pre-existing contaminant conditions but provides minimal explanation of this conclusion. The basis for this conclusion should be detailed in the text.

Response: DOE agrees with comment. As noted on page 3-2, "Additional statistical support information is presented in Appendix B...". Appendix B, page B-5, specifically defines the protocol with respect to trend definitions and defines "up, marginal" and "up, significant". With respect to pre-existing contamination conditions, this refers to the fact that above background constituent concentration levels have existed along with trends prior to waste placement in the cells. During preparation of the GWLMP for the OSDF (DOE 1997), pre-existing contamination was noted as a factor that could complicate leak detection monitoring interpretations (Reference Section 2.4 of the GWLMP). The back-up information regarding pre-existing contamination is provided within the Operable Unit 5 Remedial Investigation Report, and various RCRA annual reports. DOE will add these references to the technical memorandum.

Action: With regards to pre-existing contaminant conditions, DOE will provide references to the GWLMP, the Operable Unit 5 Remedial Investigation Report and RCRA annual reports in the technical memorandum.

6. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 4.1 Pg.#: 4-2 Line#: NA Code: C
Specific Comment #: 3
Comment: The text discusses concentration-time curves for constituents and concludes by proposing to evaluate such curves annually. Given the statistical anomalies discussed in Section 3.0, purely objective methods (such as statistical significance) may not be adequate to reveal leakage from the On-Site Disposal Facility. Some objective analysis, such as evaluation of concentration time curves, would be a useful supplement. Data for and interpretation of concentration-time relationships should be submitted regularly for review by the regulatory agencies.
Response: DOE agrees with the comment, please refer to Comment Response #1. Additionally, as they become available the data are provided to the EPA and OEPA through the IEMP Extranet Site.
Action: See Action #1.

7. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 4.1 Pg.#: 4-2 Line#: NA Code: C
Specific Comment #: 4
Comment: The text discusses the correlation between rising groundwater elevations and uranium concentrations. Based on data interpretation, the text states that the increases in uranium concentrations were due to mobilization of soluble uranium when the groundwater levels rose. The Department of Energy has collected groundwater elevation and total uranium concentration data throughout the facility over the course of several groundwater investigations. The text should discuss any similar correlations between rising groundwater elevations and increased uranium concentrations observed in the monitoring wells at the facility.
Response: The text states that the increases in uranium concentrations "may be" due to mobilization of the soluble uranium when the groundwater levels rose. DOE agrees that discussion of similar correlations between rising groundwater elevations and increased uranium concentrations in other areas of the site would help to bolster the discussion. A similar pattern has been observed in some of the monitoring wells in the South Field area.
Action: DOE will revise the text in Section 4.3.1 to reference that the correlation between rising groundwater levels and increasing uranium concentration has been observed in some of the South Field area monitoring wells in addition to some of the on-site disposal facility monitoring wells. DOE will continue to evaluate existing monitoring well data on a site wide basis to determine if this phenomenon exists in other areas. Evaluation of the site wide data will occur during preparation of the 2001 Site Environmental Report, Appendix A.

8. Commenting Organization: U.S. EPA Commentor: Saric
Section#: C Pg.#: C-1 Line#: NA Code: C
Specific Comment #: 5
Comment: It was noted that the control charts in Appendix C have relatively wide limits because few data points were available. Textbooks generally recommend that control charts be created based on data for at least 20 samples rather than the 11 to 13 samples used for this appendix. Therefore, if the additional data for a parameter in a well collected over 1 year show no evidence of changes, those data should be added to the current database, and the control charts should be recalculated for use in the following year. Eventually, if the database becomes unwieldy (that is, if it grows to contain data for more than 50 or 100 samples), the oldest sample data could be deleted as data for new samples are added.

Response: DOE agrees the comment. DOE will follow the guidance outlined within the EPA's "Statistical Analysis of Ground-water Monitoring Data at RCRA Facilities". As per the guidance, at least eight independent samples over a one-year period are recommended with respect to control charting. The baseline period allowed for more than eight samples as identified in the data package. EPA guidance referenced above will be followed when updating control charts and control limits. Text will be provided within the technical memorandum identifying this. Control charts will be updated annually and provided in the site environmental reports beginning with the report for 2002.

Action: DOE will update control charts annually and provide them in the site environmental reports.

RESPONSES TO OHIO EPA TECHNICAL REVIEW COMMENTS ON DRAFT DATA PACKAGE FOR BASELINE GROUNDWATER CONDITIONS AT THE ON-SITE DISPOSAL FACILITY CELLS 1, 2, AND 3

GENERAL COMMENTS

9. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section#: NA Pg.#: NA Line#: NA Code: M
Original General Comment #: 1
Comment: A primary conclusion of this document is that the baseline data for 12 of the 16 leak detection constituents cannot be statistically evaluated using the control chart approach and, therefore, cannot be included in the long term monitoring program for the Onsite Waste Disposal Facility. Alternative statistical approaches with acceptable false positive rates exist for situations (e.g., low detection frequency, non-normality, etc.) where control charts are not appropriate. Such approaches include the establishment of prediction limits (parametric or non-parametric) and the use of verification re-sampling. DOE should retain and propose statistical evaluation procedures for all constituents.
Response: See Comment Response #3.
Action: See Action #3.

10. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 4.0 Pg.#: 4-4 Line #: 6 Code: C
Original General Comment #: 2
Comment: The text should briefly describe the purging protocol used. Specifically, it should be clarified that the purging volumes presented are the result of purging to dryness in effort to achieve three volumes.
Response: DOE agrees with the comment.
Action: The following text will be added at the beginning of Section 4.2: "Pre-sample purging of the horizontal till wells began in November of 1998. Since that time, the horizontal till wells for Cells 1, 2, and, 3 have either been purged dry or had at least three well volumes purged prior to sample collection. The individual pre-sampling purge volumes from the horizontal till wells are provided on Figures 4-20 through 4-22."

11. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 5.0 Pg.#: 5-1 Line #: 11 Code: C
Original General Comment #: 3
Comment: As suggested in Section 4, increasing trends in the baseline data may be related to groundwater aging phenomena. Specifically, the observed trends may represent a transient condition related to changed groundwater flow patterns resulting from the construction of the waste cell. It is, therefore, anticipated that following the establishment of post-cell construction groundwater flow patterns (and absent any leakage of leachate constituents), the increasing trends will dissipate. Given that other monitoring data do not suggest that the occurrence of cell leakage (e.g., an increase in till well purge volumes, increasing concentrations in other constituents, etc.), the concentration data from these constituents could be used to establish baseline conditions once it can be established that the trend no longer is present. The monitoring plan should, therefore, allow for continued monitoring and evaluation of up-trending constituents for future base lining purposes.
Response: As discussed during the 3/12/02 conference call, DOE will continue quarterly monitoring of all constituents with greater than or equal to 25 percent detections in all horizons. Data collected from this sampling will be evaluated per EPA guidance (e.g., evaluate to determine if trends/serial correlation disappear over time). The evaluations will be provided in the annual Site Environmental Report (beginning with the report for 2002) and data will be provided on the Extranet site as it becomes available.
Action: As noted in the comment response.

12. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 5.0 Pg.#: 5-1 Line #: 11 Code: C
Original General Comment #: 4
Comment: As noted in Section 3, serial correlation indicates that the sampling interval was too frequent for the constituent under consideration. Sampling for serially correlated constituents should continue sufficient to allow the collection of enough uncorrelated data to permit statistical evaluation.
Response: Post baseline sampling for the Great Miami Aquifer will continue on a quarterly frequency as it will in the horizontal till wells, LCS, and LDS for leak detection monitoring purposes. Statistical evaluations will be performed annually to identify serial correlation or possible frequency reductions. Evaluations will be provided in the site environmental reports beginning with the report for 2002.
Action: As noted in the comment response.

13. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 5.0 Pg.#: 5-1 Line #: 29 Code: C
Original General Comment #: 5
Comment: Constituent concentrations in the leachate, in the till groundwater and Great Miami Aquifer groundwater are continuous random variables that may take on extreme values. Given that the well concentration data meets the criteria for the statistical approach for a constituent and is not typically greater than the leachate concentrations, it is appropriate to use the well data for that constituent for leak detection monitoring purposes. Future leachate concentrations of the monitored constituents are difficult to predict based on the available data. It is reasonable to expect that higher concentrations may occur wastes over the long term. The five constituent-well combinations with a maximum constituent that exceeds the associated leachate concentration should, therefore, be retained in the monitoring program.
Response: DOE agrees with the comment. As discussed during the 3/12/02 conference call, all constituents detected greater than or equal to 25 percent of the time will continue to be sampled in all horizons quarterly for Cells 1, 2, and, 3.
Action: As noted in the comment response.

14. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: B.4 Pg.#: B-5 Line #: 10 Code: C
Original General Comment #: 6
Comment: It is agreed that control chart limits should not be computed to baseline data that exhibits a trend.
Response: DOE acknowledges the comment.
Action: No action required.

15. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: C.1 Pg.#: C-3 Line #: 13 Code: E
Original General Comment #: 7
Comment: The text should read "for the normalized sampling period..."
Response: DOE agrees with the comment. It has been identified that an equation was placed incorrectly on this page.
Action: The technical memorandum will include the corrected text.

16. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: C.2 Pg.#: C-6 Line #: 11 Code: E
Original General Comment #: 8
Comment: The concentration for total organic carbon should be changed to 1.1 mg/L in the paragraph beginning on this line.
Response: DOE agrees with the comment.
Action: The technical memorandum will include the corrected value.

17. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: C.2 Pg.#: C-6 Line #: 20 Code: E
Original General Comment #: 9
Comment: The computed value of Z_1 in the calculations should be changed to -0.73. This change should also be made in the "Step 4" calculations presented on the bottom of Page C-6 and continued on the top of Page C-7.
Response: DOE agrees with the comment.
Action: The technical memorandum will include the corrected value.

18. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: Appendix C Pg.#: C-1 Line #: 5 Code: C
Original General Comment #: 10
Comment: The control charts presented in Attachments C.1 through C.4 show the baseline data plotted along with the control chart limits calculated from the data shown. As these charts are used in the future for detection monitoring, the baseline data should not be shown in accordance with U.S. EPA (1993) guidance. This is to draw a fundamental distinction between the baseline (before waste placement) data and the detection period (after waste placement has begun) data. Although it is understood that the baseline data for Cells 1 through 3 includes data collected after the start of waste placement, the baseline data met the criteria for use in calculating control chart limits (e.g., no trend, independent samples, etc.) and should not be used in detection monitoring control chart calculations.
Response: DOE acknowledges the comment. The control charts show the baseline data as additional information for the reviewers along with the calculated limits. When the control charts are updated in the annual site environmental monitoring report, the baseline data will not be plotted.
Action: As noted in the comment response.

19. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: Appendix C Pg.#: C-1 Line #: 3 Code: C
Original General Comment #: 11
Comment: Appendix C should also discuss procedures for updating the control charts in accordance with U.S. EPA (1993) guidance. As monitoring continues and the process is shown to be in control, the background mean and variance should be updated periodically to incorporate these new data. Prior to updating these parameters, the data new data should be trend tested to ensure that no trends exist. A set schedule for updating background should be established. A frequency of every one or two years is suggested in the literature.
Response: DOE agrees with the comment. EPA guidance referenced above will be followed when updating control charts and text will be provided within the technical memorandum identifying this. Control charts will be updated annually and provided in the site environmental reports, beginning with the report for 2002.
Action: As noted in the comment response.

REFERENCES

U.S. Environmental Protection Agency, 1993. Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Draft Addendum to Interim Final Guidance.